

## PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINING AUTHORITYGROSSMAN, TUCKER,  
PERREAULT & PFLEGER, PLLC

PCT

WRITTEN OPINION

(PCT Rule 66)

To: DONALD J. PERREAULT  
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MANCHESTER, NH 03101

Date of Mailing  
(day/month/year)

28 OCT 2002



Applicant's or agent's file reference

MCT004PCT

REPLY DUE

within ONE months  
from the above date of mailing

International application No.

PCT/US00/27082

International filing date (day/month/year)

28 SEPTEMBER 2000

Priority date (day/month/year)

NONE

International Patent Classification (IPC) or both national classification and IPC  
IPC(7): B01D 37/02 and US Cl.: 210/705

Applicant

YOON, ROE-HOAN

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

**When?** See the time limit indicated above. ~~The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).~~

**How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

**Also** For an additional opportunity to submit amendments, see Rule 66.4.  
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.  
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 28 JANUARY 2003

Name and mailing address of the IPEA/US

Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Authorized officer

PETER A. HRUSKOCI

WRITTEN OPINION

International application No.

PCT/US00/27082

I. Basis of the opinion

1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☒ the description:
- pages 1-41, as originally filed
- pages NONE, filed with the demand
- pages NONE, filed with the letter of

- ☒ the claims:
- pages 42-48, as originally filed
- pages NONE, as amended (together with any statement) under Article 19
- pages NONE, filed with the demand
- pages NONE, filed with the letter of

- ☒ the drawings:
- pages NONE, as originally filed
- pages NONE, filed with the demand
- pages NONE, filed with the letter of

- ☒ the sequence listing part of the description:
- pages NONE, as originally filed
- pages NONE, filed with the demand
- pages NONE, filed with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.  
These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE
- ☒ the claims, Nos. NONE
- ☒ the drawings, sheets/fig. NONE

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

\* Replacement sheets which have been filed with the international application are indicated by the following numbers:

WRITTEN OPINION

International application No.

PCT/US00/27082

**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. statement**

Novelty (N)	Claims <u>1-38</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-38</u>	NO
Industrial Applicability (IA)	Claims <u>1-38</u>	YES
	Claims <u>NONE</u>	NO

**2. citations and explanations**

Claims 1-5, 7-11, and 13-17 lack an inventive step under PCT

Article 33(3) as being obvious over Yoon et al. 5,670,056. Yoon et al. disclose (see col. 2 line 21 through col. 6 line 32) a process for dewatering a slurry of fine particulate material substantially as claimed. The claims differ from Yoon et al. by reciting specific steps for rendering the particulate material hydrophobic and for enhancing the hydrophobicity of the hydrophobic particulate material. It is submitted that the addition of a combination of non-ionic surfactants and hydrophobic polymers as disclosed in Yoon et al. would appear to render the particulate material hydrophobic and enhance the hydrophobicity of the particulate material as in the instant process. It would have been obvious to one skilled in the art to modify the process of Yoon et al. by utilizing the recited steps for enhancing the hydrophobicity of the particulate material, to aid in dewatering the slurry.

Claims 6 and 18-24 lack an inventive step under PCT Article 33(3) as being obvious over Yoon et al. as applied above, and further in view of Falcon-Steward. The claims differ from Yoon et al. by reciting a steps for comminuting the particulate material and adding an electrolyte to the slurry. Falcon-Steward disclose (see col. 3 line 17 through col. 5 line 52) that it is known in the art to comminute a solid material to form fresh surfaces, and add an electrolyte such as aluminum sulfate to a aqueous slurry of the solid material to aid in dewatering the slurry. It would have been obvious to one skilled in the art to modify the process of Yoon et al. by comminuting the particulate material and adding the recited electrolyte to the slurry in view of the teachings of Falcon-Steward, to aid in dewatering the slurry.

Claim 12 lacks an inventive step under PCT Article 33(3) as being obvious over Yoon et al. as applied above, and further in view of Wang et al. 4,210,531. The claim differs from Yoon et al. by reciting that the surfactant is blended with a specific oil. Wang et al. disclose (see col. 2 line 27 through col. 4 line 24) that it is known in the art to utilize a combination of surfactant and the recited oils, to aid in dewatering mineral (Continued on Supplemental Sheet.)

WRITTEN OPINION

International application No.

PCT/US00/27082

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claims 1-38 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because the claims indefinite for the following reason(s): In claim 1-38 "appropriate", "low", "water contact angle", "greatly", "when", "etc.", "suitable", "normally", "considerably", "various", "disclosed in claim 11", "high", "identified in claims 14, 15, and 16", and "not limited to", "the same as for claim 1", are vague and indefinite because it is unclear how these terms further limit the claims. In claims 1, 18, 25, 30, and 35 "the surfactant molecules" and "the conditioned slurry", in claim 10 "the said mechanical means", in claim 21 "the reagents", in claims 22, 27, 32, and 36 "the range", in claims 23, 24, 28, 29, 33, 34, 37, and 38 "the constraints and conditions", and in claims 25, 30, and 35 "the filter cake", lack clear antecedent basis.

WRITTEN OPINION

International application No.

PCT/US00/27082

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 10

**TIME LIMIT:**

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

**V. 2. REASONED STATEMENTS - CITATIONS AND EXPLANATIONS (Continued):**

slurry concentrates. It would have been obvious to one skilled in the art to modify the process of Yoon et al. by utilizing a surfactant blended with the recited oils in view of the teachings of Wang et al., to aid in dewatering the slurry.

Claims 25-29 lack an inventive step under PCT Article 33(3) as being obvious over Yoon et al. as applied above, and further in view of Sun. The claims differ from Yoon et al. by reciting that the filter cake is subjected to a vibratory means. Sun disclose (see col. 1 line 12 through col. 2 line 64) that it is known in the art to subject a filter cake to an vibratory means, to aid in removing moisture from the filter cake. It would have been obvious to one skilled in the art to modify the process of Yoon et al. by utilizing the recited vibratory means in view of the teachings of Sun, to aid in removing moisture from the filter cake.

Claims 30-34 lack an inventive step under PCT Article 33(3) as being obvious over Yoon et al. as applied above, and further in view of Kenney 5,346,630. The claims differ from Yoon et al. by reciting that a surface tension lowering reagent is added to a filter cake in the form of a mist or spray. Kenney disclose (see col. 4 lines 1-61) that it is known in the art to spray a filter cake with a surface tension lowering reagent to aid in dewatering a coal slurry. It would have been obvious to one skilled in the art to modify the process of Yoon et al. by adding the recited reagent to the filter cake in the form of a spray in view of the teachings of Kenney, to aid in dewatering the slurry.

Claims 35-38 lack an inventive step under PCT Article 33(3) over Yoon et al. in view of Falcon-Steward as applied above, and further in view of Sun and Kenney 5,346,630. The claims differ from the references as applied above by reciting that the filter cake is subjected to a vibratory means, and that a surface tension lowering reagent is added to a filter cake in the form of a mist or spray. Sun disclose (see col. 1 line 12 through col. 2 line 64) that it is known in the art to subject a filter cake to a vibratory means, to aid in removing moisture from the filter cake. Kenney disclose (see col. 4 lines 1-61) that it is known in the art to spray a filter cake with a surface tension lowering reagent to aid in dewatering a coal slurry. It would have been obvious to one skilled in the art to modify the references as applied above, by utilizing the recited vibratory means and by adding the recited reagent to the filter cake in the form of a spray in view of the teachings of Sun and Kenney respectively, to aid in removing moisture from the filter cake and dewatering the slurry.

Claims 1-38 meet the criteria set out in PCT Article 33(2), because the prior art does not disclose a method of dewatering a slurry of fine particulate material utilizing the method steps recited in the instant claims.

Claims 1-38 have industrial applicability and meet the criteria set out in PCT Article 33(4) because the method can be used in industry to dewater a slurry of fine particulate material.

----- NEW CITATIONS -----

US 5,520,822 A (SUN) 28 May 1996, col. 1 line 12 through col. 2 line 64.